

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-9 are presently active in this case, Claims 1-5 having been amended and Claims 6-9 having been added by way of the present Amendment.

The Official Action indicated that Claims 2-4 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims. Claims 6-8 contain the subject matter of original Claims 2-4, respectively, and Claim 9 contains the subject matter of Claim 5/2, which was not rejected based on prior art in the Official Action. Claims 6-9 have been written to address all of the rejections under 35 U.S.C. 112, second paragraph, set forth in the Official Action for Claims 2-5, and base Claim 1. Please note that a change was made to the recitation of the gas discharge pipe in Claim 6, namely, the phrase "the middle of" was changed to "a section of." The Applicant respectfully submits that Claims 6-9 are in condition for allowance.

In the outstanding Official Action, the drawings were objected to for a minor informality. Submitted concurrently herewith is a Letter Requesting Approval of Drawing Changes which includes amendments in red ink to Figure 1 to address the objections by adding the legend "Related Art." Accordingly, the Applicant requests the withdrawal of the objection to the drawings.

Claim 2 was objected to for minor informalities. Accordingly, Claim 2 has been amended to correct the spelling of vitrification in line 1. The Applicant therefore requests the withdrawal of the objection to Claim 2.

Claims 1-5 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 has been amended to provide proper antecedent basis for the gas discharge pipe. Claim 1 has also been amended to clarify that a first gas feeding means and a second gas feeding means are recited therein. Claim 2 has been amended to clarify that the drain conduit is connected to the gas feed branch pipe connected to the second gas feeding means. Accordingly, the Applicant submits that the claims are definite, and respectfully requests the withdrawal of the indefiniteness rejections.

Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by Yoshikai (U.S. Patent No. 4,726,764). Claim 5/1 was rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikai in view of Habasaki et al. (U.S. Patent No. 5,639,290). For the reasons discussed below, the Applicant respectfully requests the withdrawal of the art rejections.

Claim 1 of the present application recites a porous preform vitrification apparatus comprising a furnace core tube accommodating a porous preform, a heating furnace surrounding the furnace core tube and heating the furnace core tube, a first gas feeding means for feeding a first gas essentially consisting of helium to the furnace core tube, a first gas feed rate controlling means for controlling a feed rate of the first gas, a first gas discharging means including a gas discharge pipe connected to the furnace core tube and an exhaust suction pump connected to the gas discharge pipe, a first gas discharge rate controlling means for controlling a discharge rate of the gas discharged by the first gas discharging means, a gas feed branch pipe connected to the gas discharge pipe between the first gas discharge rate controlling means and the exhaust suction pump, and a second gas feeding means connected to the gas feed branch pipe for feeding a second gas, which comprises nitrogen or air, to the

gas discharge pipe. The Applicant submits that the Yoshikai reference does not disclose all of the limitations recited in Claim 1 of the present application.

The Yoshikai reference describes a heat treating apparatus that includes, among other features, a core tube (2) having a discharge conduit (9) with an exhaust blower (12) on an end thereof. The discharge conduit (9) has a throttle valve (13) in between the core tube (2) and the exhaust blower (12), and a control regulating valve (26A) in a side conduit connected to the discharge conduit (9) at a location between the throttle valve (13) and the exhaust blower (12). The control regulating valve (26A) is described as being connected at the outlet side of the throttle valve (13) to the exhaust conduit (9) to regulate the feeding amount of external air by regulating to open and close the valve, thereby regulating the pressure at the outlet side of the valve (13). (See column 3, lines 24-28.)

The Applicant submits that the Yoshikai reference does not disclose a porous preform vitrification apparatus comprising, among other features, a second gas feeding means connected to the gas feed branch pipe for feeding a second gas, which comprises nitrogen or air, to the gas discharge pipe, as recited in Claim 1 of the present application. The present application describes a non-limiting embodiment of the structural features of the present invention in paragraphs [0025] to [0033] with reference to Figure 2, which suppresses the pressure fluctuation of the gas inside the furnace core tube (20) to a minimum level ([0026]). Namely, nitrogen or air is introduced by the gas feed branch pipe (20) and the force blower (21) via the gas feed rate controlling means (19) into the discharge pipe of the treatment gas ([0029]). To the contrary, the Yoshikai reference does not disclose a second gas feeding means as recited in Claim 1, but rather the Yoshikai reference merely describes a control regulating valve (26A) that is used to regulate the feeding amount of external air by regulating to open and close the valve. No actual gas feeding means is provided in the

Yoshikai reference that corresponds to the second gas feeding means recited in Claim 1 of the present application.

Accordingly, the Applicant respectfully requests the withdrawal of the anticipation rejection of Claim 1.

Claim 5/1 is considered allowable for the reasons advanced for Claim 1 from which it depends. This claim is further considered allowable as it recites other features of the invention that are neither disclosed, taught, nor suggested by the applied references when those features are considered within the context of Claim 1.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.


Finally, the attention of the Patent Office is directed to the change of address of Applicants' representative, effective January 6, 2003:

Oblon, Spivak, McClelland, Maier & Neustadt, P.C.
1940 Duke Street
Alexandria, VA 22314.

Please direct all future communications to this new address.

Respectfully Submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Registration No. 25,599
Attorney of Record

Christopher D. Ward
Registration No. 41,367



22850

Customer Number 22850
Tel. (703) 413-3000
Fax. (703) 413-2220
(OSMMN 10/01)

GJM:CDW:brf
I:\atty\cdw\204838US3CONT\am1.doc

Marked-up Copy

Serial No.: 09/842,003

Amendment Filed on: April 15, 2003

IN THE CLAIMS

1. (Once Amended) A porous preform vitrification apparatus comprising:

a furnace core tube accommodating a porous preform[,];

a heating furnace surrounding the furnace core tube and heating the furnace core tube[,];

a first gas feeding means for feeding a first gas essentially consisting of helium to the furnace core tube[,];

a first gas feed rate controlling means[,] for controlling a feed rate of the first gas;

a first gas discharging means[, and] including a gas discharge pipe connected to the furnace core tube and an exhaust suction pump connected to the gas discharge pipe;

a first gas discharge rate controlling means[,] for controlling a discharge rate of the gas discharged by the first gas discharging means;

[characterized in that] a gas feed branch pipe [is] connected to [the middle of] the gas discharge pipe [connecting the furnace core tube] between the first gas discharge rate controlling means and [an] the exhaust suction pump; and

[in that nitrogen or air is fed from the] a second gas feeding means [provided at the front end of the gas feed branch pipe] connected to the gas feed branch pipe for feeding a second gas, which comprises nitrogen or air, to the gas discharge pipe.

2. (Once Amended) A porous preform [vitrifictaion] vitrification apparatus as set forth in claim 1, [wherein] further comprising a drain conduit [is provided in] connected to

the gas feed branch pipe connected [from] to the second gas feeding means [to the gas discharge pipe].

3. (Once Amended) A porous preform vitrification apparatus as set forth in claim 1 [or 2], further comprising a mechanism for detecting a pressure difference between a pressure in [a] the furnace core tube and a pressure in a heating furnace body provided at an outer circumference of the furnace core tube, and for comprehensively controlling:

a feed rate of the first gas to the furnace core tube,

a discharge rate of an exhaust gas from the furnace core tube,

a feed rate of an inert gas into the heating furnace body,

a discharge rate of the gas from the interior of the heating furnace body,

a feed rate of [a] the second gas [such as nitrogen] fed to the gas feed branch pipe, and [further]

a gas discharge rate of the discharge gas at the exhaust suction pump based on [a] the detected differential pressure signal with the pressure in the furnace core tube as a reference.

4. (Once Amended) A porous preform vitrification apparatus as set forth in claim 3, wherein the feed rate of the [nitrogen or air] second gas fed from [a nitrogen or other] the gas feed branch pipe is controlled to 15 to 50% of the rate of the treatment gas essentially consisting of helium fed to the furnace core tube.

5. (Once Amended) A group of porous preform vitrification apparatuses comprised of a plurality of porous preform vitrification apparatuses as set forth in claim 1 or 2 arranged in parallel, [characterized in that] wherein:

[an] the exhaust suction pump is provided for every porous preform vitrification apparatus, and

a common exhaust gas treatment device is provided on the discharge side of the

exhaust suction pumps.

6. (New)

7. (New)

8. (New)

9. (New)